INFORMATION HANDOUT

For Contract No. D01-0B3604
At 01-Hum-36-PM 35.9

Identified by
Project ID Proj0112000120

PERMITS

U.S. Fish and Wildlife Service

United States Army Corps of Engineers, Non-Reporting Nationwide 404

MATERIALS INFORMATION

Geotechnical Design Recommendations, Dinsmore Slipouts/Sink, August 1, 2013

Memorandum

Flex your power!
Be energy efficient!

To: FERMIN BARRIGA
BRANCH CHIEF
North Region Design Branch M2

Date: August 1, 2013

File: 01-HUM-36-PM 35.5-40.5
EA: 01-0B3601
EFIS ID: 0112000120
Storm Damage Repair

Attn: Abel Huerta, Project Engineer

From: **DEPARTMENT OF TRANSPORTATION**
DIVISION OF ENGINEERING SERVICES
OFFICE OF GEOTECHNICAL DESIGN NORTH BRANCH B

Subject: Geotechnical Design Recommendations, Dinsmore Slipouts/Sink

Introduction

The Office of Geotechnical Design North (OGDN) is providing Geotechnical Design Recommendations for five storm-damage sites, which are located on State Route (SR) 36 in Humboldt County (Figure 1). The subject sites were damaged during significant rainfall in March 2011, as described in the five Damage Assessment Forms (DAF's #16, 17, 61-63).

The scope of work performed by OGDN included review of geologic maps, surface field investigations, and preparation of this memorandum. We performed no drilling and we have no subsurface information.

Please note that all Station locations reported in this memo are approximate.

Field Investigations

The Office of Geotechnical Design North Branch B performed site investigations between May and August of 2012. During the investigations, we mapped hillslope and drainage features measured rag-tape topographic cross sections through unstable areas, and identified rock and soil. The degree of roadway deformation observed differed from what is shown in the DAF photos, due to repaving prior to our investigations.

On February 26, 2013, we met with the PDT team at all five sites for a field review. We observed roadway deformation, including the growth and extension of cracks we observed in 2012.

On June 5, 2013, personnel from the Office of Geotechnical Design North Branch B met on site with personnel from Design to further assess Locations 3-5.

Geology

The project sites are underlain by the mélange and broken formation of the Central Belt Franciscan Complex and the metagraywacke of Hammerhorn Ridge of the Eastern Belt of the Franciscan Complex (Figure 2). Three locations are in the Central Belt of the Franciscan Complex: Location 1 (PM 35.8) is in unit cb1; Locations 2 and 3 (PM's 37.3 and 37.7) are in unit cm1. Locations 4 and 5 (PM 39.81 and PM 39.9) are in unit ybh of the Eastern Belt of the Franciscan Complex.

The mélange (unit cm1) is predominantly penetratively sheared, locally tuffaceous, scaly meta-argillite with less abundant blocks of metasandstone. The broken formation (unit cb1) is bedded to massive, locally folded, rarely conglomeratic metasandstone and meta-argillite, with minor amounts of highly sheared rocks. The metagraywacke of Hammerhorn Ridge (unit ybh) is dominantly a lawsonite- and pumpellyite-bearing, coherent, lithic quartzo-feldspathic metagraywacke with lesser amounts of meta-argillite and metaconglomerate and abundant basal layers of metachert. Locally, the latter unit includes scarce, fine-grained, greenstone, gabbro, and tectonically interleaved serpentinite (McLaughlin and others, 2000).

LOCATION 1, DAF #16, HUM 36 PM 35.80-36.00

Photos and drawings of the storm deformation are shown in DAF #16. Approximately 800 feet of the westbound lane and unpaved shoulder settled to create a "sink" in the roadway between PM 35.80 and PM 36.00. Two shallow debris slides occurred along the cutslope between Stations 113+00 and Station 113+90. The hillslope below the roadway was eroded below the outlet of the cross culvert at PM 35.80.

The current plan is to place a 20-foot-deep, 780-foot-long underdrain between PM 35.80 and PM 35.95; place RSP to stabilize the debris slides above the roadway; construct horizontal drains along the existing cutslope; replace the culvert at PM 35.80; place DD and RED; reconstruct the roadway; reconstruct MBGR.

Field Investigations

During 2012 and 2013, we observed cracks in the roadway between Stations 115+00 and 115+70 and near Station 119+00 (Figure 3B). The full extent of the original damage was not visible, because the site had been paved twice since the storm damaged occurred.

We mapped and surveyed the cracks in the roadway. We measured rag-tape topographic sections of the embankment and the roadway near PM 35.86, observing hummocky topography and an additional scarp on the embankment between Station 114+75 (PM 35.85) and Station 119+20. We also measured topographic sections through the two debris slides on the cutslope that are shown in the DAF.

In addition to the two debris slides shown in the DAF, which are centered at Station 113+20 and Station 113+70, we observed debris slides farther west. These include an active debris slide between Station 111+65 and Station 112+00, and debris slides of variable ages from Stations 111+00 to Station 111+50, from Stations 112+00 to Station 112+31, and from Station 112+52 to 113+00 (Figure 3A).

We observed eight active seeps where groundwater exits from the cutslope in the summer. The seeps are located between Station 111+70 and Station 115+00. We also observed several dry, deformed horizontal drains, which are shown on the plan map (Figure 3A). During late summer (July and August, 2012) we observed flowing and standing water in the inboard ditch to the west of Station 115+00.

The cutslope exposes pale-brown, dry, gravelly lean clay with sand (CL). The CL is mostly fines; some gravel, from coarse to fine, angular; little sand. Along the cutslope and the inboard ditch, we found cobbles of sandstone; medium grained; dark brownish gray on fresh surfaces; yellowish brown on weathered surfaces; moderately weathered; moderately hard.

LOCATION 2, DAF #17, HUM 36 PM 37.2-37.4

Photos in the DAF show parts of the slipout that damaged 400 feet of the westbound lane and turnout. Work proposed in the DAF included placing an underdrain. Because fresh to slightly weathered, hard, intensely fractured bedrock is exposed in the inboard ditch, we are not recommending an underdrain in that location. Design is planning improvements for the drainage of surface water. We have no recommendations for Location 2.

Field Investigation

We observed cracks along the left outboard side of the paved turnout in 2012. The DAF shows cracks west of the turnout in the westbound lane. The site was repaved and the cracks covered before our investigation.

We observed water flowing in the inboard ditch in August of 2012. We noted indications of groundwater exiting the cutslope at four locations: (1) Between stations 206+70 and 207+30, heavy green vegetation suggests groundwater seeps from the cutslope beneath the riprap. (2) Near Station 207+80, cutslope erosion well above the elevation of the roadway created an alluvial fan in the inboard ditch. (3) Between stations 207+60 and 208+00, we observed flowing water in the ditch. (4) Near station 209+40, the inboard ditch was wet below the brow ditch and water flowed toward the cross drain at PM 37.36.

LOCATIONS 3A and 3B, DAF #61, HUM 36 PM 37.7 to 38.0

The site of DAF #61 is divided into two locations for discussion. Location A extends from PM 37.72 to Burr Valley Road (PM 37.79). The roadway settled between PM 37.72 and PM 37.76, creating a sink affecting both lanes. Location 3B extends from Burr Valley Road (PM 37.79) to PM 37.95. The DAF reports that a 400-foot-long sink formed in the roadway. We found cracks in the roadway between Station 236+07 and Station 240+55.

At Location 3A, the plan is to construct a 10-foot deep underdrain. At Location 3B the plan is to construct two 10-foot-deep underdrains, construct an RSP embankment on the outboard side of the roadway near PM 37.90, replace the culvert at PM 37.90, and place RED. The roadway will be reconstructed at both locations.

Field Investigation

Location 3A

We conducted our field investigation of Location 3A (Figure 4) in July of 2012. We also visited the site during the onsite PDT meeting in February of 2013.

We surveyed cracks in the asphalt between Stations 228+20 and 229+90. The cutslope at Location 3A is 0.65:1; we observed shallow debris slides between Station 229+30 and Station 229+90. The cutslope exposes silty gravel with sand (GM) and clayey gravel with sand (GC). We anticipate this material will be encountered during excavation for the proposed underdrain.

Location 3B:

Due to erosion along the outboard edge of the roadway, between Station 237+00 and Station 239+75, the roadway is as narrow as 21 feet (EP-EP) near PM 37.90. To the east and west the roadway is ≥25 feet wide (EP-EP).

In 2013 we observed cracks in the roadway between Stations 236+00 and 236+40. The DAF indicates this was an area of deformation in March 2011. In 2012 and 2013, we noted cracks extending from the right side of the roadway at Station 239+00 into the westbound lane to Station 239+60.

During July of 2012, we observed that the inboard ditch was moist from Station 235+10 eastward, and wet from Station 238+20 eastward to PM 37.90 (Figure 5).

The cutbank exposes light gray, dry, silty gravel with sand (GM) at Station 239+07, which we anticipate will be encountered during excavation for the proposed underdrain. The GM consists of mostly gravel, from coarse to fine, mostly angular (some larger pieces of coarse gravel are subrounded); little sand, from coarse to fine, angular; few to little fines. Cementation is weak. The GM contains cobbles and coarse gravel of dark-gray, fine-grained sandstone and dark-gray argillite. The cobbles are silicified and heavily veined by quartz.

LOCATION 4, DAF #62, HUM 36 PM 39.81

A slipout damaged approximately 100 feet of the westbound lane. The plan is to construct a 10-foot-deep underdrain.

Field Investigation

McLaughlin and others, (2000) indicate that this location is underlain by the metagraywacke of Hammerhorn Ridge, which has been metamorphosed under relatively high pressure conditions. The lawsonite- and pumpellyite-bearing, coherent, lithic quartzo-feldspathic metagraywacke is

moderately to extremely hard, and may be encountered during excavation. We found extremely hard, silicified rock exposed on the cutslope. The metachert, which is observed locally in the metagraywacke of Hammerhorn Ridge, will be extremely hard as well. We found chert exposed below the roadway embankment at PM 39.81.

We investigated Location 4 during July and August of 2012, and on February 26, 2013. We observed cracks in the unpaved turnout and westbound lane for a length of 115 feet (Figure 6).

In August 2012, we observed stream flow infiltrating beneath the culvert inlet. A large area of embankment erosion is visible at the culvert outlet at PM 39.81. According to As-Built files, a new pipe was placed at this site in 1992-1993. Below the roadway, we observed a functioning outlet. We saw no evidence of water seeping around the outside of the pipe. The outlet pipe lies between bedrock and overlying fill; it emerges from the slope as a "shotgun" culvert outlet. We observed a dry stream bed from the outlet pool to the Van Duzen River in June 2013. The stream water had infiltrated into the subsurface.

Soil on the cutslope includes gray to grayish brown, moist, silty gravel with sand (GM). The GM consists of mostly gravel, from coarse to fine, angular; little sand, from coarse to fine, angular; little fines. Cementation is weak. The GM contains gravel- and cobble- sized clods of strongly cemented soil (GM).

LOCATION 5, DAF #63, HUM 36 PM 39.9-40.0

A slip out damaged the westbound lane for a distance of approximately 300 feet, between PM 39.95 and PM 40.00. Photos of the deformation and the MBGR are shown in DAF #63.

The plan is to construct two 10-foot deep underdrains, improve surface drainage, reconstruct the roadway, repair the culvert at PM 39.95, and reconstruct the MBGR.

Field Investigation

We investigated Location 5 during July and August of 2012 and during the on-site PDT meeting on February 26, 2013. We observed cracks for a distance of approximately 70 feet adjacent to the guardrail (along the line of MBGR posts) from the cross culvert at Station 419+55 to Station 420+25. In February of 2013, cracks had developed in the westbound lane from Station 419+70 to Station 420+12.

During August 2012, we observed flowing water in the inboard ditch between Station 417+50 and PM 39.95, and between Station 422+00 and PM 40.0 (Figure 7). We observed water seeping from the cutslope at Station 422+20 and water standing in the inboard ditch at PM 40.00.

This location is underlain by the metagraywacke of Hammerhorn Ridge (McLaughlin and others, 2000). We observed very hard to extremely hard, silicified rock exposed on the cutslope at Station 419 + 75 and Station 420+40. Bedrock might be encountered during excavation of the proposed underdrain.

Based on observations of the soil and rock exposed in the cutslope, we expect that silty gravel with sand (GM) and hard to extremely hard, moderately to intensely fractured rock will be encountered in the excavation for the proposed underdrain.

Recommendations

LOCATION 1

1. Construct a 20-foot deep underdrain between PM 35.80 and PM 35.86 and between PM 35.86 and PM 35.95 (Figures 3A and 3B). Typical underdrain design details are shown in Figure 8.

2. Install 150-foot-long "horizontal" drains on 20-foot centers between Station 115+00 and PM 35.80. A typical section and design details for horizontal drains are shown in Figure 9.

   The horizontal drains should be drilled approximately 4 feet above the base of the cut and extend 100 feet into the cutslope. The drains should be drilled at an uphill gradient of 5%. The drains should consist of 90 feet of slotted plastic pipe and 10 feet of solid plastic pipe. We recommend the largest slot width of 0.05 inch for the slotted pipe. Please refer to Figure 9 and the Standard Specifications Section 68-3 for the design and construction details for horizontal drains.

3. From Station 113+00 to Station 113+35, excavate approximately 4 feet into the toe of the existing cutslope to remove slide debris. The backslope of the cut should have a slope ratio of approximately 0.85H:1V and be approximately 14 feet high. The base of the excavation should slope 5% toward the inboard ditch for drainage. We do not recommend placing RSP fabric prior to placement of RSP. Backfill the excavation with ¼ ton RSP. Placement

of rock should be in accordance with Section 72-2.03B Placement Method A of the 2010 Standard Specifications. The finished slope face should match the existing slope of approximately 1.5:1 (Figure 10).

From Station 113+60 to Station 113+85, excavate approximately 4 feet into the toe of the existing cutslope debris slide. The backslope of the cut should have a slope ratio of approximately 0.75H:1V and be approximately 12 feet high. The base of the excavation should slope 5% toward the roadway for drainage to the ditch. We do not recommend placing RSP fabric prior to placement of RSP. Backfill the excavation with ¼ ton RSP. Placement of rock should be in accordance with Section 72-2.033 Placement Method A of the 2010 Standard Specifications. The finished slope face should match the existing slope of approximately 1.5:1 (Figure 11).

LOCATION 3A

4. Construct a 20-foot deep underdrain between PM 37.72 and PM 37.76 (Figure 4). Do not cut into the existing cutslope.6.

LOCATION 3B

5. Construct 10-foot deep underdrains as follows: between Station 235+90 and PM 37.90, between PM 37.90 and station 239+15, and between Station 239+30 to PM 37.95.

6. Construct an RSP embankment on the left side of the roadway from Station 237+00 to Station 239+75 (Figure 12). The final roadway widths will be determined by Design.

   - Excavate a 1:1 slope allowing at least 14 feet for one-lane traffic and K-rail during construction.
   - The base of the excavation should slope approximately 5% toward the toe of the slope for drainage.
   - Place RSP to achieve roadway width required by Design. Figure 12 shows a nominal width of approximately 25 feet.
   - Place class 8 RSP fabric at the base of the excavation, on the excavated cutslope, and above the ¼-ton rock (see below) so as to wrap the RSP on three sides (See Section 72-1.03 in the 2010 Standard Specifications, regarding placement of fabric).

- Place ¼-ton rock in accordance with Section 72-2.03B of the 2010 Standard Specifications.
- The finished slope face should be 1:1 or gentler. We prefer a gentler slope such as 1.5H:1V.
- Place one foot of Class No. 3 rock (Placement Method B) above the RSP filter fabric.

7. Grade the inboard ditch to drain.

LOCATION 4

8. Construct a 10-foot deep underdrain from Station 410+50 to the cross drain at PM 38.81 (Figure 6).

LOCATION 5

9. Construct a 10-foot deep underdrain from Station 418+20 to the cross drain at PM 39.95 (Figure 7).

   Construct a second 10-foot deep underdrain from Station 418+20 to outlet either to a new underdrain outlet, at approximately Station 421+55, or in the inboard ditch within the project limits.

RECOMMENDATIONS FOR PROPOSED UNDERDRAINS

10. See Figure 8 and Section 68-2 of the 2010 Standard Specifications for details regarding the design of underdrains.

11. The excavations for the underdrains should slope a minimum of 5% toward the underdrain outlets.

12. The underdrains should be constructed with Class 1 Permeable Material - Type B.

13. Place corrugated, fully perforated, plastic pipe (minimum diameter of 8 inches) 6 inches above the bottom of the underdrains and connect to the outlet pipes.

14. The outlet pipes should be a minimum of 8 inches in diameter and be solid plastic pipe.

15. The outlet pipes should slope a minimum of 2%.
16.
17. Hydraulics should be consulted regarding the location of the underdrain outlets.

18. Terminal risers should be constructed at the ends of each proposed underdrain (see Section 68-2, of the 2010 Standard Specifications for details).

19. The width of the excavations must be a minimum of 2 feet.

20. If the underdrains are constructed beneath asphalt, place Class A filter fabric beneath the structural section on top of the permeable material (Figure 8).

21. If the underdrains are located beneath fill, the top of the underdrain should be designed in accordance with the "UNDER UNPAVED SHOULDER / DITCH" detail shown in Figure 8. Note the minimum 12 inch overlap of the RSP Fabric and Geomembrane is on all sides of the excavation.

Construction Considerations

1. We recommend beginning the excavations for the underdrains at the outlets. Offset underdrain outlets from the locations of existing cross culverts.

2. Temporary shoring may be required to support the excavation for some of the proposed underdrains.

3. Large rocks may be encountered during excavation.

4. If non-rippable rock is encountered during excavation, contact the Office of Geotechnical Design North Branch B for additional recommendations.

5. Groundwater may be encountered during excavation.

6. Utilities are buried beneath the inboard ditches and the underdrains should be offset where necessary.

7. At Location 1, As-Built plans indicate that shallow underdrains, approximately 3.55 feet deep, exist on the right side of the roadway. These underdrains may be encountered during construction. The same plans indicate that in 1980, 15 horizontal drains were installed along the cutbank between stations 109+60 and 114+15. A few of the horizontal drains were noted along the cutslope.

8. At Location 3B, given the height and length of the proposed RSP embankment, excavate in segments if necessary.

9. At Location 5, very hard to extremely hard bedrock may be encountered in the excavation for the proposed underdrain between Station 419 + 75 and Station 420+40.

10. During drilling of the horizontal drains it is likely that loose soil, rock, and groundwater will be encountered.

The Office of Geotechnical Design North Branch B will provide an approved nonstandard Special Provision (nSSP) for the Geomembrane (Water Barrier).

We request that the Project Plans be submitted to the Office of Geotechnical Design North Branch B for review prior to final design.

If you have any questions or require further assistance, please contact Dawn McGuire at (707) 441-3994 or Charlie Narwold at (707) 445-6036.

Report written by:

PROFESSIONAL GEOLOGIST
DAWN JEANINE McGUIRE
No. 2280
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

Dawn McGuire, CEG #2280, CHG #905
Engineering Geologist
Geotechnical Design North
Branch B

Report reviewed by:

REGISTERED GEOLOGIST
CHARLES FREDERICK NARWOLD
No. 2335
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

Charlie Narwold, CEG, #2335
Senior Engineering Geologist
Geotechnical Design North
Branch B

Reference

McLaughlin, R.J., Ellen, S.D., Blake, M.C. Jr., Jayko, A.S., Irwin, W.P., Aalto, K.R., Carver, G.A., and Clarke, S.H. Jr., 2000, Geology of the Cape Mendocino, Eureka, Garberville, and southwestern part of the Hayfork 30 X 60 minute quadrangles and adjacent offshore area, northern California: Miscellaneous Field Studies MF-2336, 1:100,000 and Pamphlet, 27 p.

Figures

Figure 1. Project Location Map
Figure 2. Geologic Map
Figure 3A. Location 1 Plan Map, southern portion
Figure 3B. Location 1 Plan Map, northern portion
Figure 4.- Location 3A Plan Map
Figure 5.- Location 3B Plan Map
Figure 6.- Location 4 Plan Map
Figure 7. Location 5 Plan Map
Figure 8. Typical design details for a deep underdrain
Figure 9. Horizontal drain typical section and design details
Figure 10. Typical section of proposed RSP between Station 113+00 and Station 113+35
Figure 11. Typical section of proposed RSP between Station 113+60 and Station 113+85
Figure 12. Typical section of proposed RSP embankment.

C: OGDN PROJECT FILE

DINSMORE SLIPOUTS/SLIDES PROJECT

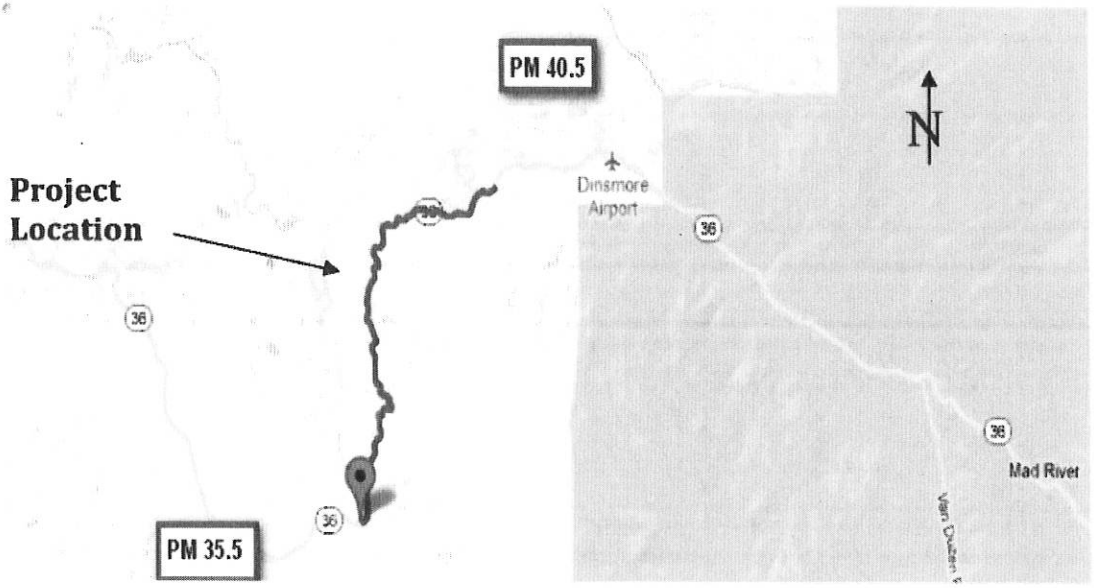


Figure 1. – Project location map for Dinsmore Slipouts/Slides, EA 01-0B3601.

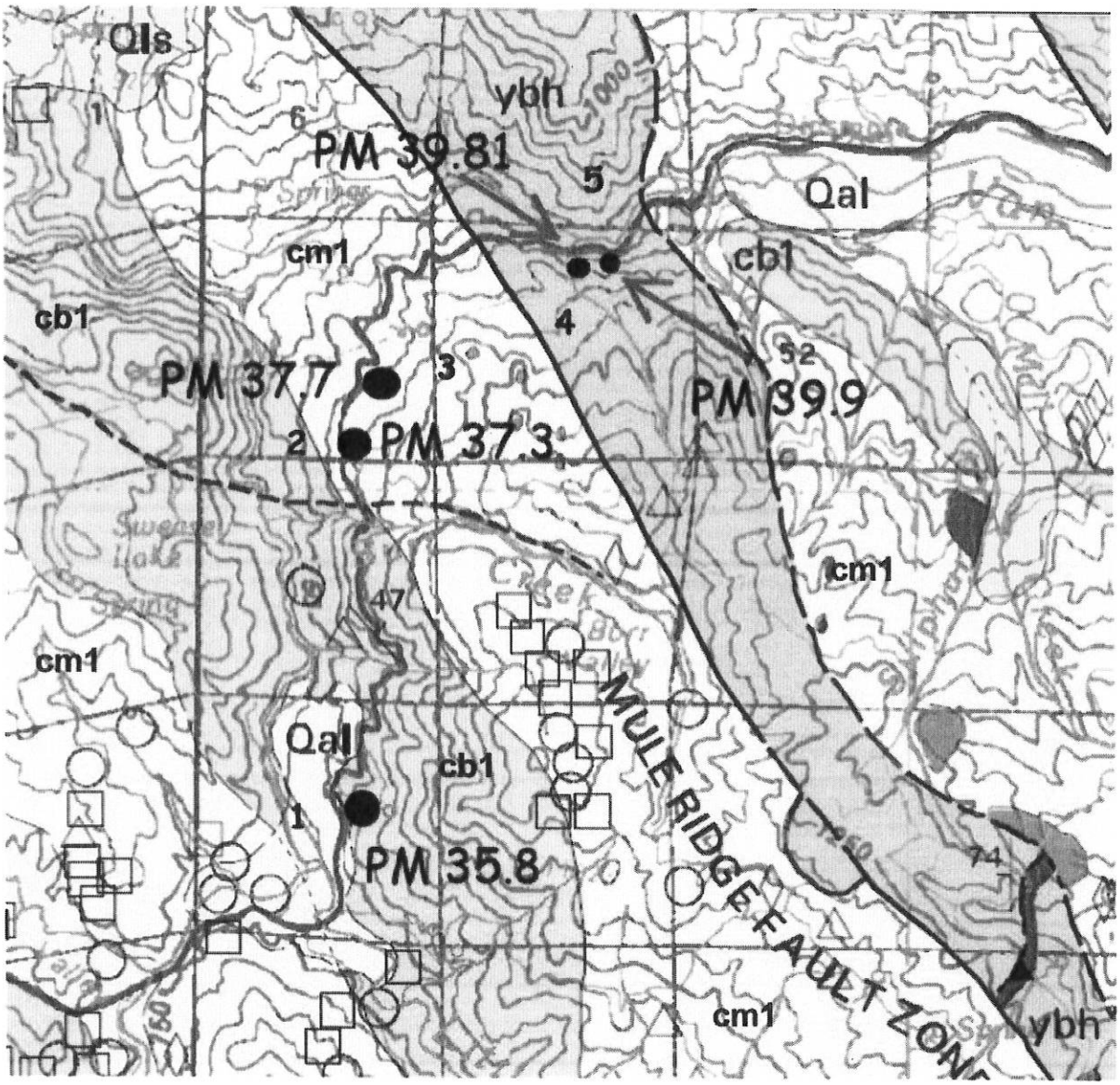


Figure 2. --Geologic map showing the locations of the five DAF's in Project 01-0B3601. All projects are located in the Franciscan Complex of the Coast Ranges Province.

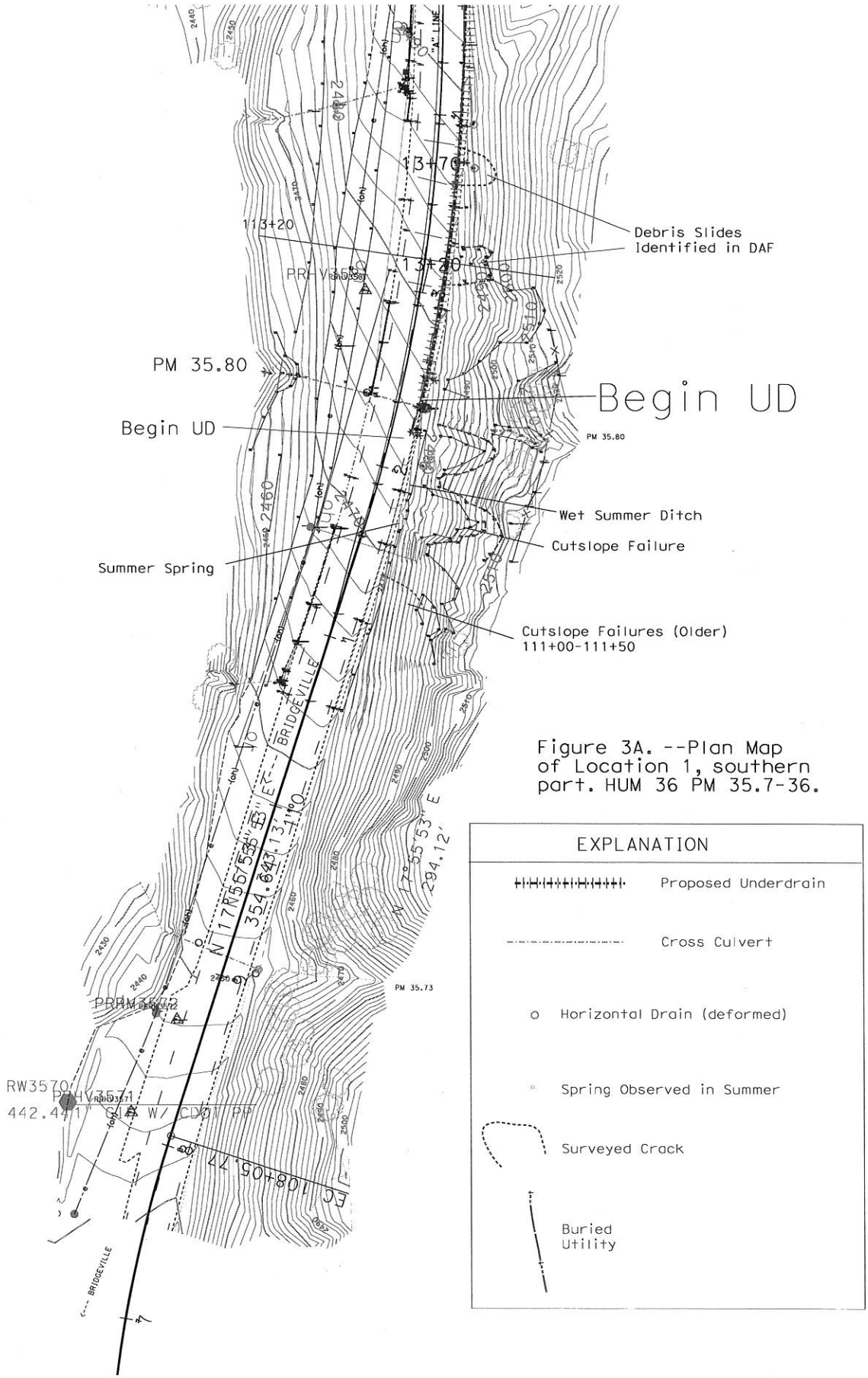


Figure 3A. --Plan Map of Location 1, southern part. HUM 36 PM 35.7-36.

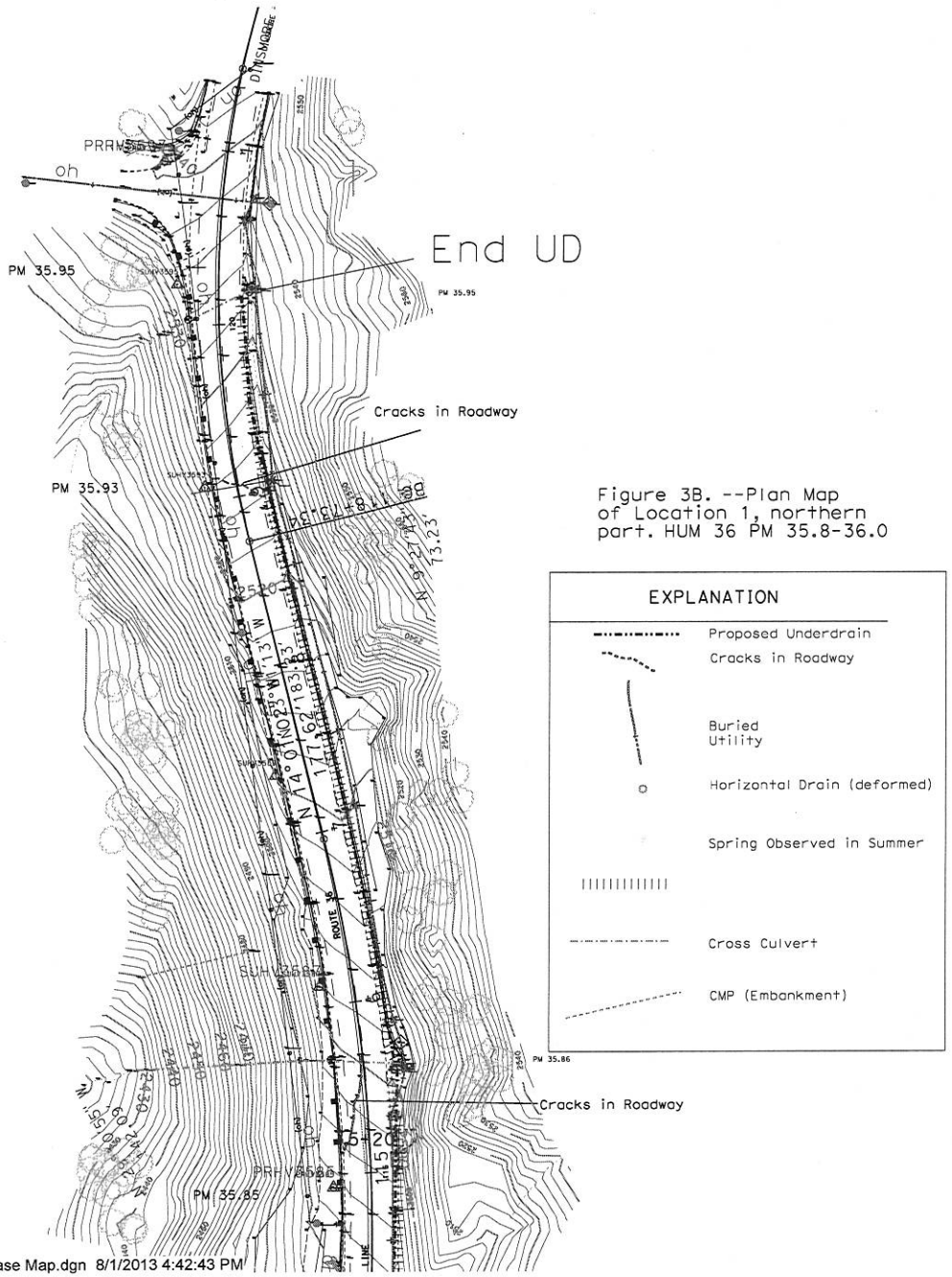


Figure 3B. --Plan Map of Location 1, northern part. HUM 36 PM 35.8-36.0

...\LOC_1\Loc 1 Base Map.dgn 8/1/2013 4:42:43 PM

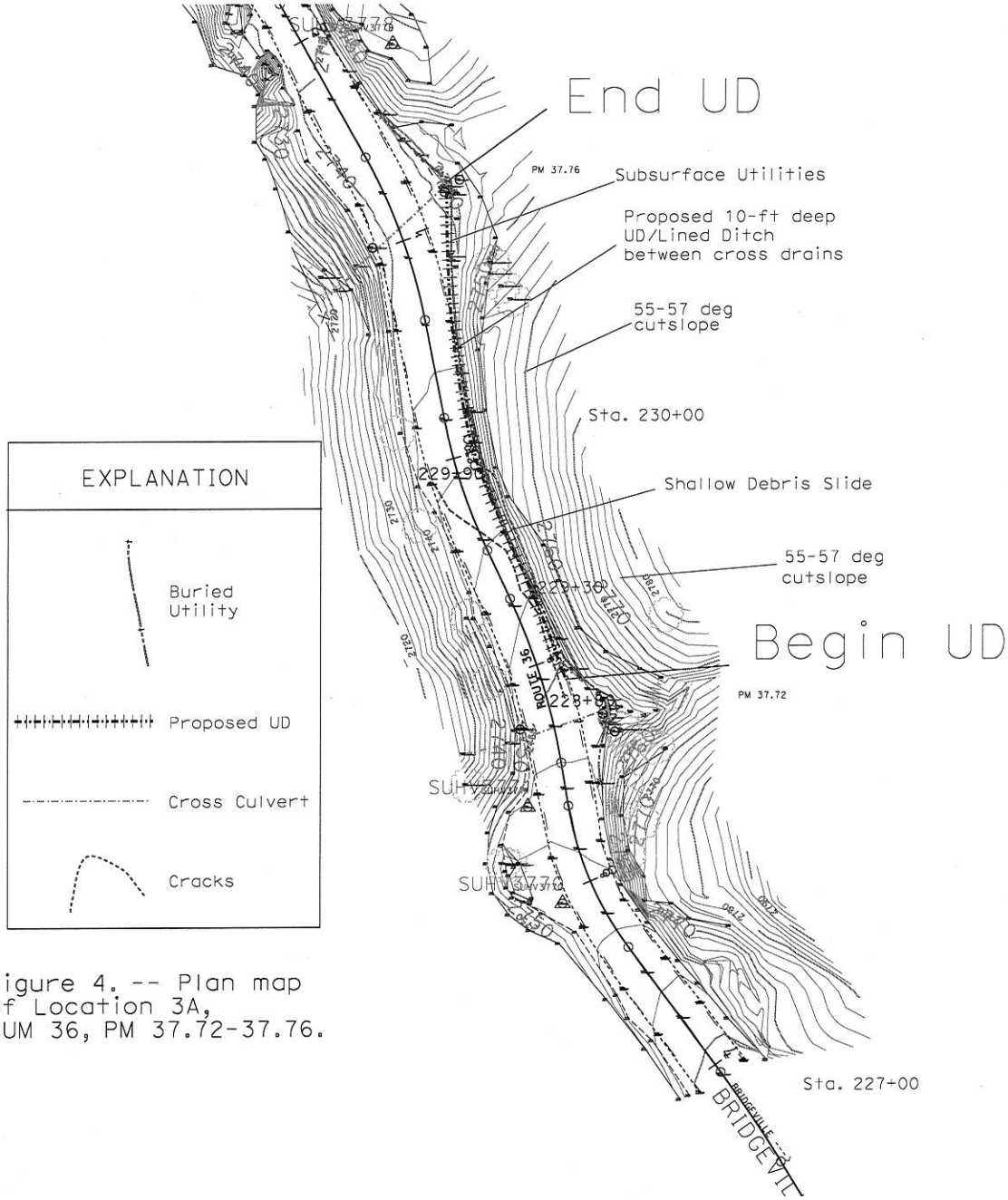


Figure 4. -- Plan map of Location 3A, HUM 36, PM 37.72-37.76.

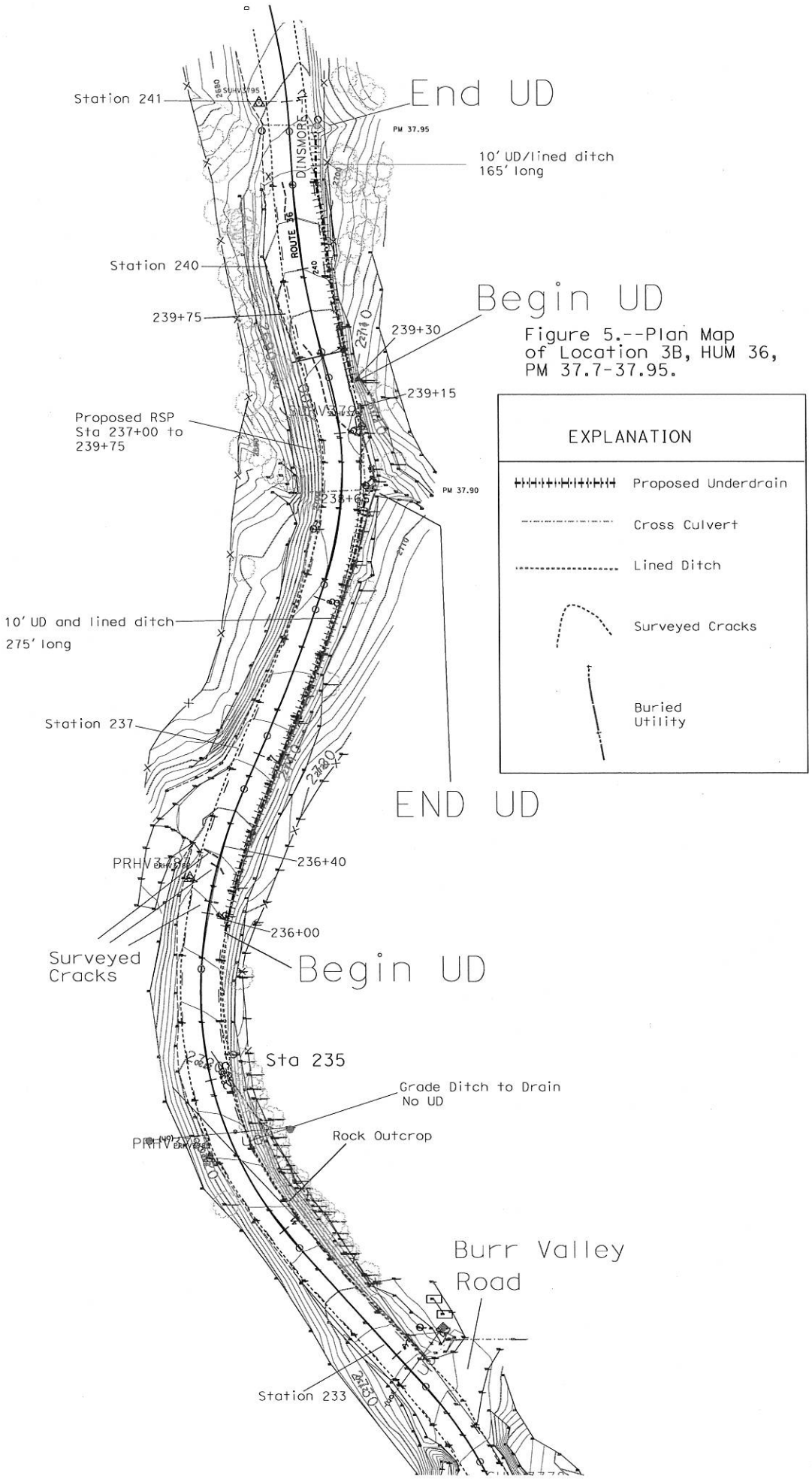
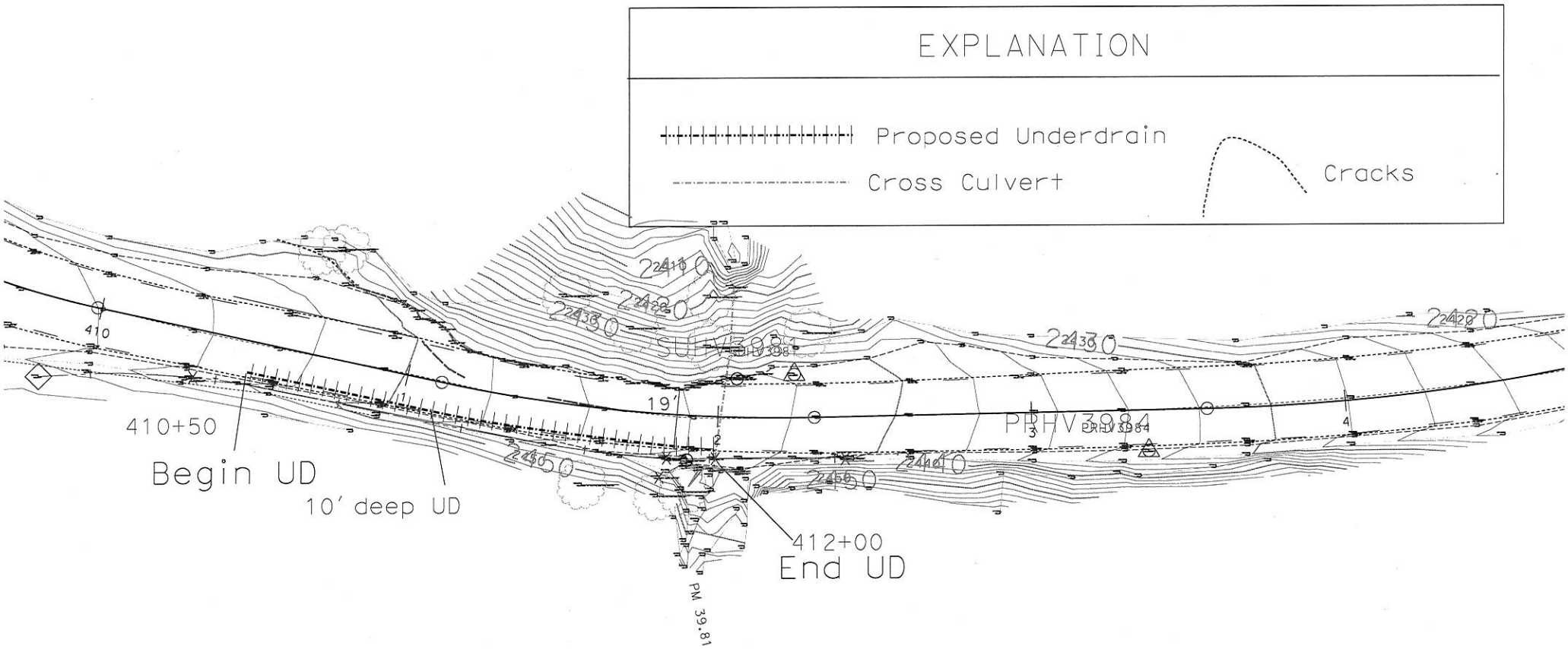


Figure 5.--Plan Map of Location 3B, HUM 36, PM 37.7-37.95.

Figure 6 -- Plan Map of Location 4, HUM 36, PM 39.81



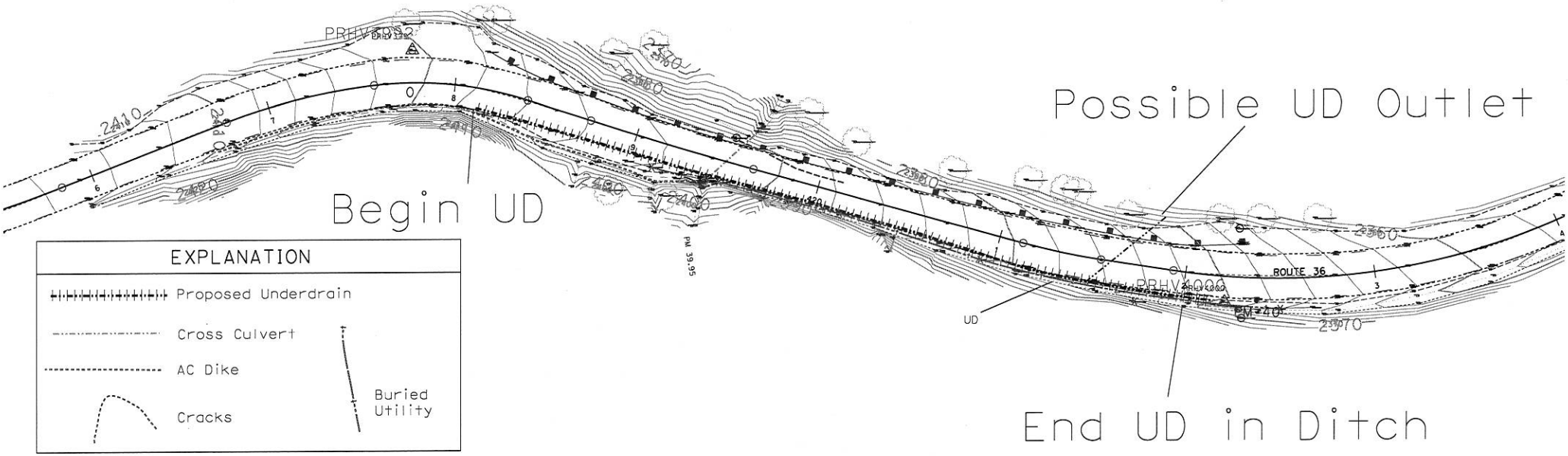
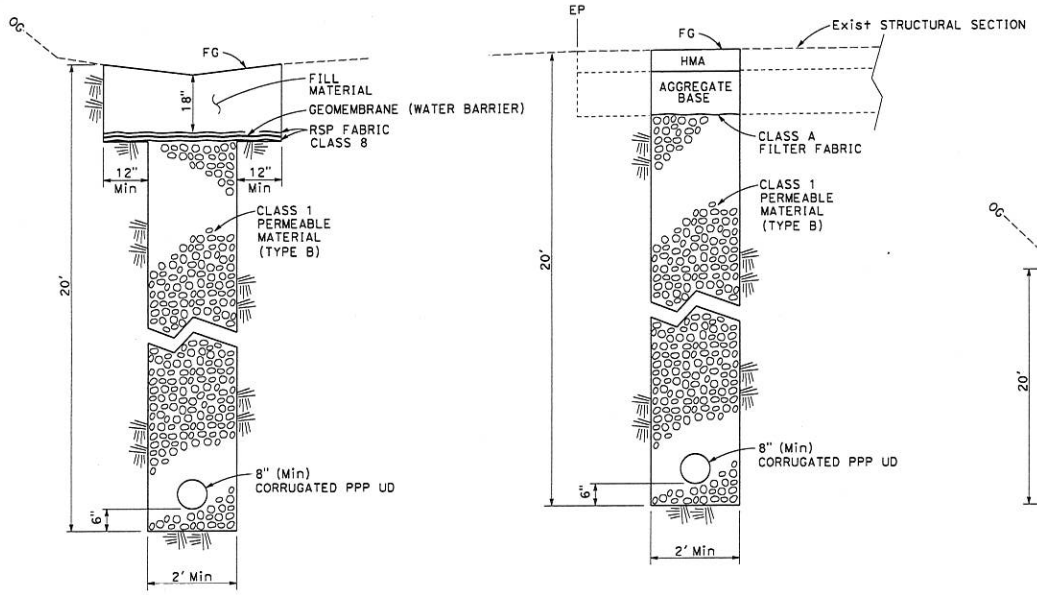


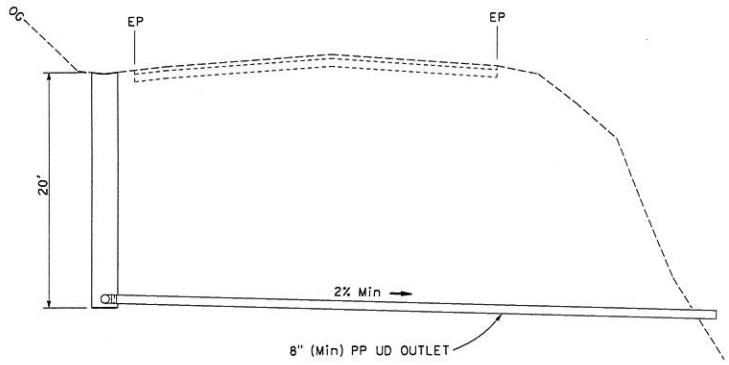
Figure 7. --Plan Map of Location 5, HUM 36, PM 39.9 - 40.0.



UNDER UNPAVED SHOULDER / DITCH

UNDER PAVEMENT

DEEP UNDERDRAIN TYPICAL CROSS SECTIONS



PROFILE

UNDERDRAIN OUTLET DETAIL

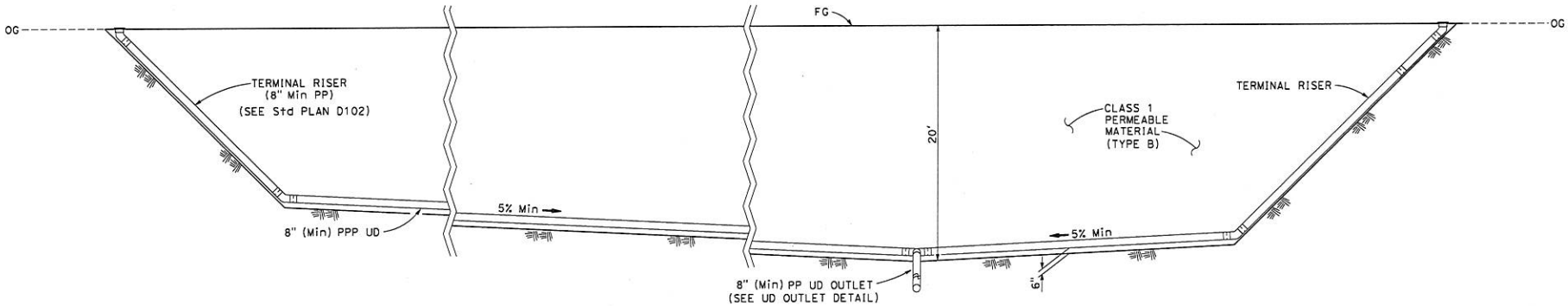


Figure 8. -- Typical design details for a deep underdrain.

PROFILE

DEEP UNDERDRAIN

NO SCALE

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

REGISTERED PROFESSIONAL ENGINEER No. Exp. CIVIL STATE OF CALIFORNIA

REVISED BY | DATE REVISED

CALCULATED-DESIGNED BY | CHECKED BY

FUNCTIONAL SUPERVISOR

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

DESIGN

LAST REVISION 00-00-00 DATE PLOTTED => &DATE TIME PLOTTED => &TIME

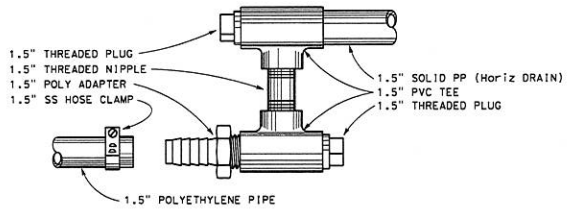
BORDER LAST REVISED 4/24/2013 | USERNAME => Dawn McGuire DGN FILE => &REQUEST | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | OGDN BRANCH B | PROJECT NUMBER | EFIS: 0112000120

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER No. Exp. CIVIL STATE OF CALIFORNIA



PLAN VIEW

HORIZONTAL DRAIN CONNECTOR UNIT

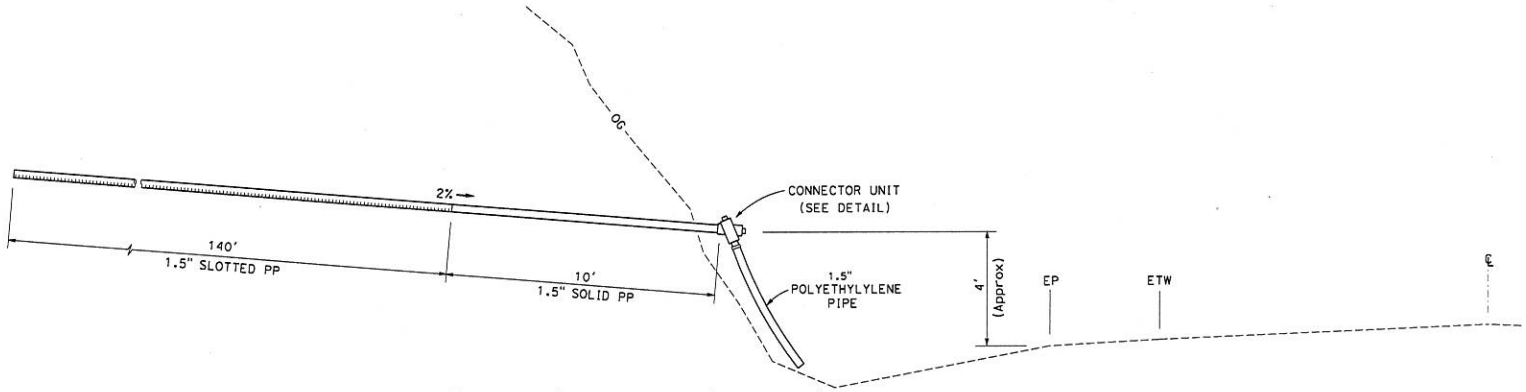


Figure 9. -- Horzontal drain typical profile section and design details.

PROFILE

HORIZONTAL DRAIN

NO SCALE

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION | FUNCTIONAL SUPERVISOR | CALCULATED/DESIGNED BY | CHECKED BY | REVISED BY | DATE REVISED

DESIGN

BORDER LAST REVISED 7/2/2010

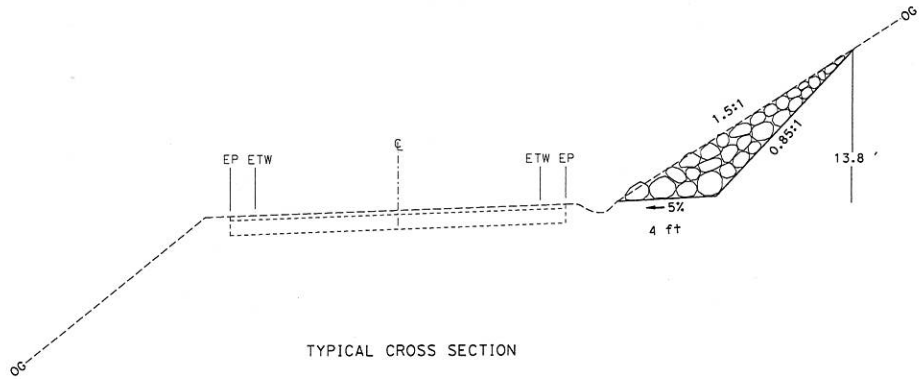
USERNAME => D. McGuire
DGN FILE => Fig_4_HorizDrian.dgn

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

GEOTECH

PROJECT NUMBER & PHASE 01120001121

LAST REVISION 00-00-00 | DATE PLOTTED => 9DATE | TIME PLOTTED => 9TIME



TYPICAL CROSS SECTION

NO SCALE

Figure 10. -- Typical section of proposed RSP at Location 1 between Station 113+00 and Station 113+35.

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

REGISTERED PROFESSIONAL ENGINEER — No. — Exp. — CIVIL — STATE OF CALIFORNIA

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans DESIGN

FUNCTIONAL SUPERVISOR: EUNICE GRAM SUPERVISOR

CALCULATED-DESIGNED BY

CHECKED BY

REVISED BY

DATE REVISED

LAST REVISION 00-00-00 DATE PLOTTED => #DATE TIME PLOTTED => #TIME

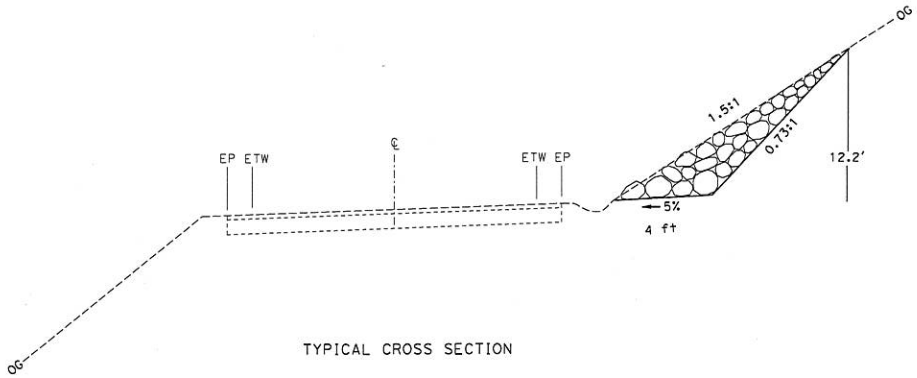
BORDER LAST REVISED 7/2/2010

USERNAME => $USER
DGN FILE => $REQUEST

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT: GEOTECH, OGDN

PROJECT NUMBER & PHASE EFIS ID: 01120000120



TYPICAL CROSS SECTION

NO SCALE

Figure 11. -- Typical section of proposed RSP at Location 1 between Station 113+60 and Station 113+85.

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — No. — Exp. — CIVIL — STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

DESIGN

FUNCTIONAL SUPERVISOR: FUNCTIONAL SUPERVISOR

CALCULATED-DESIGNED BY: FUNCTIONAL SUPERVISOR

CHECKED BY

REVISED BY

DATE REVISED

BORDER LAST REVISED 7/2/2010

USERNAME => #USER
DGN FILE => #REQUEST

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT: GEOTECH, OGDN

PROJECT NUMBER & PHASE EFIS ID: 01120000120

LAST REVISION 00-00-00 DATE PLOTTED => #DATE TIME PLOTTED => #TIME

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

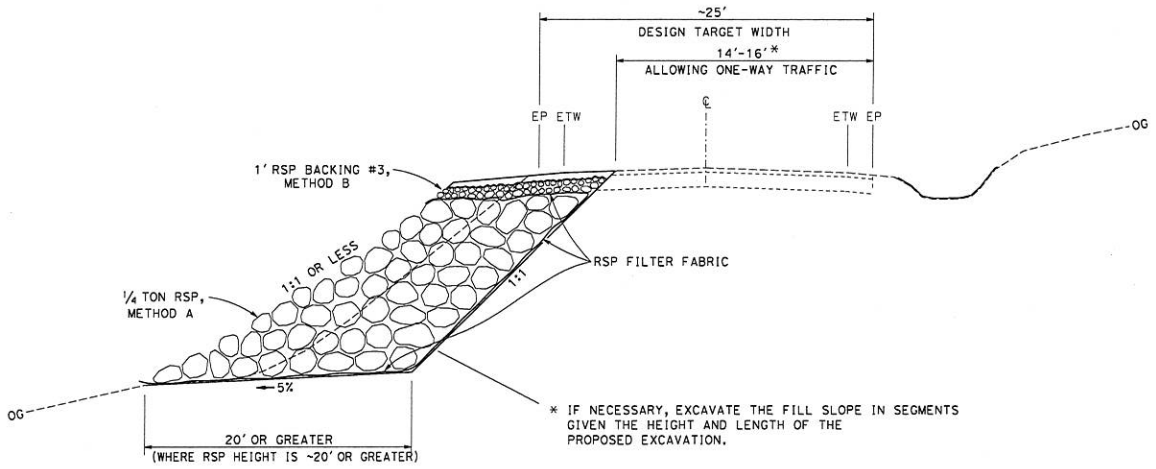
REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

REGISTERED PROFESSIONAL ENGINEER — No. — Exp. — CIVIL — STATE OF CALIFORNIA

Figure 12. --Typical section of proposed RSP buttress at Location 3B, between Station 237+00 and Station 239+75.



TYPICAL CROSS SECTION

NO SCALE

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN
FUNCTIONAL SUPERVISOR: C. Norwold
CALCULATED-DESIGNED BY
CHECKED BY
REVISED BY
DATE REVISED

LAST REVISION 00-00-00 DATE PLOTTED => May 21, 2013 TIME PLOTTED => $TIME

BORDER LAST REVISED 7/2/2010 | USERNAME => D. McGuire DGN FILE => $RFQUEST | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | UNIT: Geotech, 3657 | PROJECT NUMBER & PHASE | EFIS ID: 01120000120